FACULTY	: Education
DEPARTMENT	: CHILDHOOD EDUCATION
CAMPUS	: SWC
MODULE	: MATINA3
SEMESTER	: First
EXAM	: June Supplementary Exam 2020

DATE	: June 2020	**SESSION**	
ASSESSOR(S)	: Mr E LIBUSHA		
MODERATOR	:Dr L. Abdulhamid (University of Witwatersrand)		
DURATION	: 72bhours (Three days)	**MARKS**	: 100

INSTRUCTIONS

Read the following instructions carefully before answering the questions.

1. This is an exam equivalence. It is a take home exam.

2. Read all question carefully and answer all questions.

3. This exam should be **typed**. Use Arial theme and a font 12.

Question 1 [van Hiele theory]

1.1 Read the following paragraph and answer the questions below:

The van Hiele theory describes how young people learn geometry. It postulates five levels of geometric thinking which are labelled visualization, analysis, abstraction, formal deduction and rigor. Each level uses its own language and symbols. Students or pupils pass through the levels "step by step.

Use the following resource to support your understanding of van Hiele theory of Geometric thinking

1. Webb, P., & Feza, N. (2005). Assessment standards, Van Hiele levels, and grade seven learners' understandings of geometry. *Pythagoras*, 2005(62), 36-47.

2. De Villiers, M. (2010, June). Some reflections on the van Hiele theory. *In Invited plenary from 4th Congress of teachers of mathematics*.

3. Luneta, K. (2014). Foundation phase teachers'(limited) knowledge of geometry. *South African journal of childhood education*, 4(3), 71-86.

1.1.1 Use your own words to describe the 5 van Hiele levels of geometry understanding. Use diagrams on the topic of three dimensional shapes to illustrate each level.　　25

1.1.2 Is the development of geometric understanding related to age or maturation? experience? instruction? Give a reason to substantiate why you think the development of geometric understanding is related or not related to the three components mentioned above.　　10

1.1.3 Give your reasoning on what can happen if the teacher is thinking at a different van Hiele level than the students and what can happens if a teacher tries to teach at a level of thought that is above a student's level?　　10

1.1.4 What are the implications of the van Hiele theory for my instructional practices?　　5

Marking guidelines		
Description of each level	25	**For each level** ✓ Correct ✓ Clear ✓ Own words ✓ 3D diagram ✓ Diagram link with explanation
Explain what maturation is in relation to geometry and van Hiele levels. Substantiate using theory, the relationship it has with van Hiele development of geometric understanding if there is any and make a conclusion. Explain what experience in relation to geometry and van Hiele levels. Substantiate using theory, the relationship it has with van Hiele development of geometric understanding if there is any and make a conclusion. Explain what instruction is in relation to geometry and van Hiele levels. Substantiate using theory, the relationship it has with van Hiele development of geometric understanding if there is any and make a conclusion.	15	**Per component** ✓ Correct explanation ✓ Clear explanation ✓ Correct explanation of the link ✓ conclusion ✓ Own words
What does it mean to thinking at a different van Hiele level than the students and to teach at a level of thought that is above a student's level? Reasoning	5	✓ Correct explanation ✓ Clear ✓ Own words ✓ Reasoning ✓
Name at least 2 implications of the van Hiele theory and its effect.	5	✓ Implications ✓ ✓ How does it each implication affect the practice ✓ ✓ Own words

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Question 2 [Data Handling]

Two English classes, 7A and 7B are in competition to see which class performed better in the June Examination. The marks of the leaners are recorded below. Both classes have 20 learners. (Marks are given in %).
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Grade 7A	Grade 7B
45	69
60	74
29	88
40	49
60	37
70	52
87	87
56	36
28	68
53	45
70	57
50	45
33	72
98	83
58	76
56	95
80	70
36	86
69	65
78	43

2.1	What is the mean mark of the learners in Class 5A and what is the mean mark of the learners in Class 5B	2
2.2	What can you deduce from the comparison of these two means in terms of performance between the two classes?	2
2.3	Using a Histogram (use the interval 0-10,11-20, 21-30…), explain which class performed better	8
2.4	Draw a box-and-whisker plot for both classes on the same number line. What would you say about the nature of the distribution of learner performance in each class?	10
2.5	What can you deduce from the comparison of all your above data in terms of performance between the two classes as your overall conclusion?	3

	Marking guide line	
4.1	Calculation of the mean	One mark per correct answer
4.2	Interpretation of the mean	2 marks for the interpretation
4.3	Histogram for 5A Histogram for 5B Interpretation of 5A histogram Interpretation of 5B histogram Comparison and conclusion	2 2 1 1 2
4.4	Box and whiskers Nature of distribution in 5A Nature of distribution in 5B Overall conclusion supported by box-and whisker	5 2 2 1
4.5	Overall conclusion	3

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Question 3

Give a step by step guide to explain how you will teach grade 5 learners to define a rectangle and a square and be able to differentiate between the two.   15

Introduction	3	
Explain what the curriculum document require grade 5 to know about rectangle and square.	3	
Required pre knowledge	2	
Examples to use	2	
Method to use	3	
Assessment to use	2	

[15]

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Question 4

James said that "a cube and a rectangular prism" is one and the same thing". On the other hand, Busi does not agree. Use your own words to explain the difference between a cube and a rectangular prism and also explain how you can convince other learners that Busi and James's reasoning are both justified. (Use diagrams to explain   10

The difference between the two	2	
Diagrams of the two	2	
Justification of Busi	2	
Justification of James	2	
Conclusion	2	

[10]

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Total:100